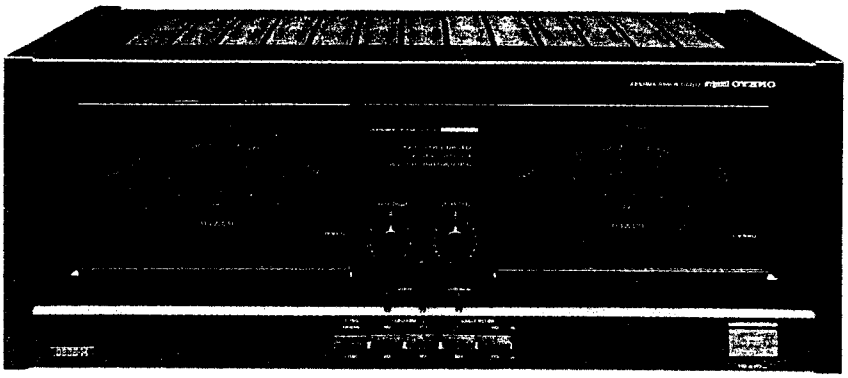
M-5590

SERIAL NO. 3232

ONKYO SERVICE MANUAL

Stereo Power Amplifier

MODEL M-5590 =71508



UG	220V AC, 50Hz

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK ⚠ ON THE SCHEMATIC DIAGRAM AND IN THE PARTS LIST ARE CRITICAL FOR RISK OF FIRE AND ELECTRIC SHOCK. REPLACE THESE COMPONENTS WITH ONKYO PARTS WHOSE PARTS NUMBERS APPEAR AS SHOWN IN THIS MANUAL.

MAKE LEAKAGE-CURRENT OR RESISTANCE MEASUREMENTS TO DETERMINE THAT EXPOSED PARTS ARE ACCEPTABLY INSULATED FROM THE SUPPLY CIRCUIT BEFORE RETURNING THE APPLIANCE TO THE CUSTOMER.

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ONKYO® AUDIO COMPONENTS

SPECIFICATIONS

Music Power Output:	2 x 450 watts at 4 ohms, 1kHz (DIN)	2 x 260 watts at 8 ohms, 1kHz (DIN)
Continuous Power Output:	2 x 315 watts at 4 ohms, 1kHz (DIN)	2 x 215 watts at 8 ohms, 1kHz (DIN)
	200 watts per channel, min. RMS, at 8 ohms, both channels driven, from 20 Hz to 20 kHz, with no more than 0.003% THD	
Total harmonic distortion:	0.003% at rated power	
	0.003% at 1 watt output	
Intermodulation distortion:	0.003% at rated power	
Frequency response:	+0, −1.5 dB at 1Hz to 100kHz	
Input sensitivity:	1.0V	
Input impedance:	20kohms	
Damping factor:	140 (8 ohms, 1kHz)	
S/N ratio:	120 dB (IHFA, Shorted)	
Outputs:	SPEAKERS 1 & 2, AC OUTLET (120V models only)	
Inputs:	INPUT (VARIABLE, DIRECT)	
Power Supply:	AC 220V, 50Hz	
Dimensions:	465(W) x 185(H) x 426(D) mm	
	18 5/16" x 7 9/32" x 16 25/32"	
Weight:	25 kg, (55.1 lbs.)	

Specifications and features are subject to change without notice.

PRECAUTIONS

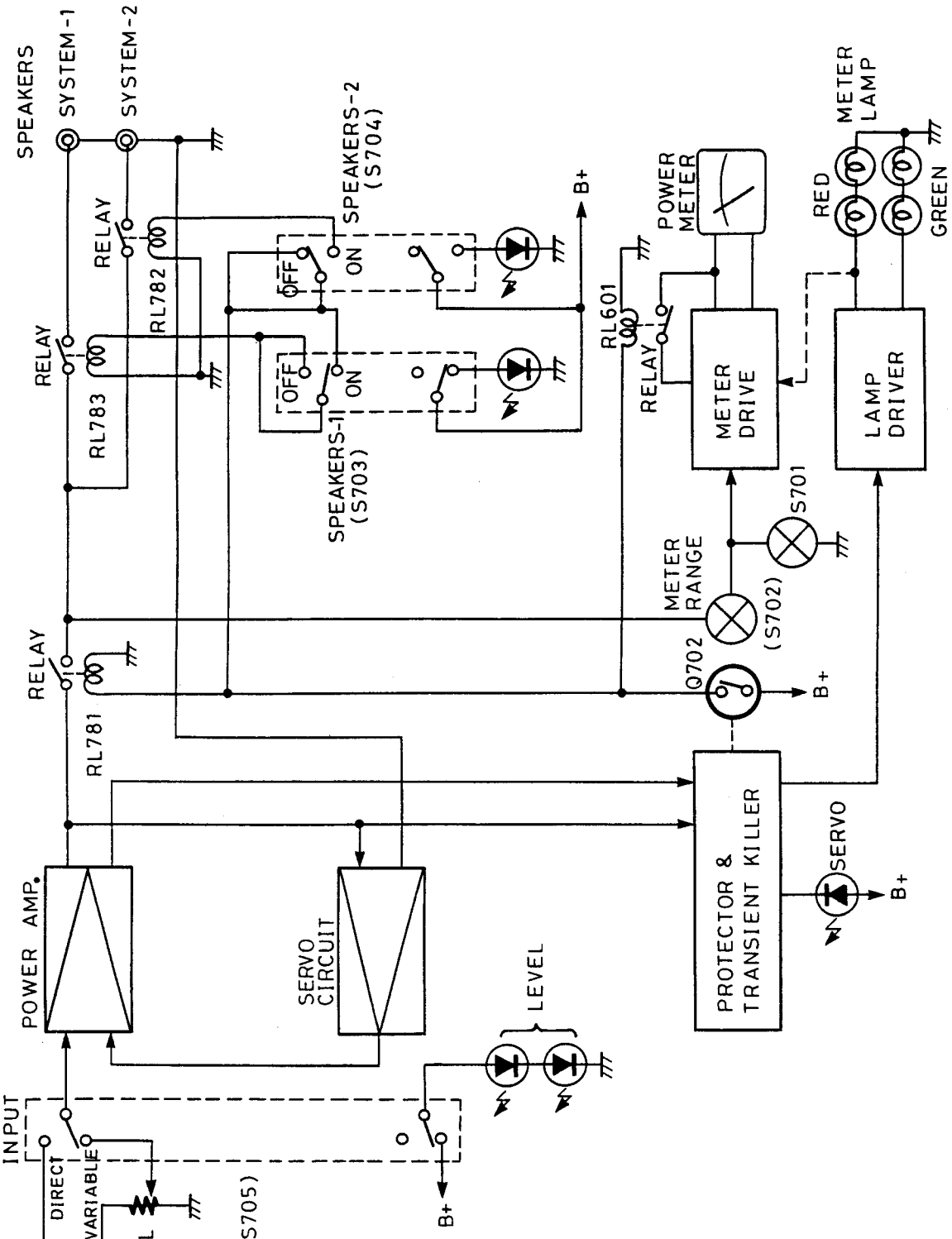
1. **Replacing the fuses**
   For continued protection against risk fire, replace only with same type and same rating fuse.

CIRCUIT NO.	PARTS NO.	DESCRIPTION
F803, F804	252077	4A–SE–EAK, Primary fuse
F702	252074	2A–SE–EAK, Secondary fuse

2. **Replacing the lamp**
   This unit uses the lamp listed below.

CIRCUIT NO.	PARTS NO.	DESCRIPTION
PL881, PL882	210191	PL14V 150mA (Green)
PL883, PL884		
PL885, PL886	210192	PL14V 150mA (Orange)
PL887, PL888		

BLOCK DIAGRAM



ADJUSTMENT PROCEDURES

1. Preparation

(1) Leave the machine in a normal condition parallel to the work bench, maintaining a clearance of 15mm from the bottom for air circulation.
(2) Set the level to minimum with no load and no signal.
(3) When making the adjustment, there must be no breeze blowing from the outside.

2. Zero adjustment of meter

(1) Turn power OFF.
(2) Make the adjustment with the zero adjustment knob to set the meter needle to zero.

Caution: Do not make the adjustment immediately after turning off the power.

3. Adjustment of idling current

(1) Turn ON the power switch, and leave the unit as is for about 5 minutes.
(2) Adjust the semi-fixed resistor R423 (R424) so that the voltage between the terminals V_{CT} and I_{ID} of the printed circuit board NAPA-2625 is 15mV.

4. Meter circuit offset adjustment

(1) Adjust the semi-fixed resistor R645 (R646) of the printed circuit board NAMA-2615 so that the meter needle is at zero.

5. Meter circuit level adjustment

(1) Input the 1kHz signal from the low frequency oscillator so that the amplifier output is 12.65V (22.0db).
(2) Adjust the semi-fixed resistor R613 (R614) of the printed circuit board NAMA-2615 so that the meter needle is at 0db.

Caution: The adjustment must be made while inputting the signal to a each single channel of the L and R channels.

6. Operating check of protection circuit

(1) When the power switch is turned ON,
1) Even though there is a signal input, the meter should have no deflection.
- The meter lighting lamps PL885, PL886, PL887, and PL888 (red) light.
- SERVO OPERATION LED does not light.

2) After about 5 minutes, relay RL781 of the NAOP-2619 printed circuit board and relay RL601 of NAMA-2615 go ON.
- SERVO OPERATION LED lights.
- The meter lighting lamps change to PL881, PL882, PL883, and PL884 (green).
- When SPEAKER SWITCH 1 and 2 are turned ON, relay RL782 and RL783 go ON.
- The meter needle deflects in response to the signal.

(2) When the power is turned OFF,
- Immediately all relays go OFF.

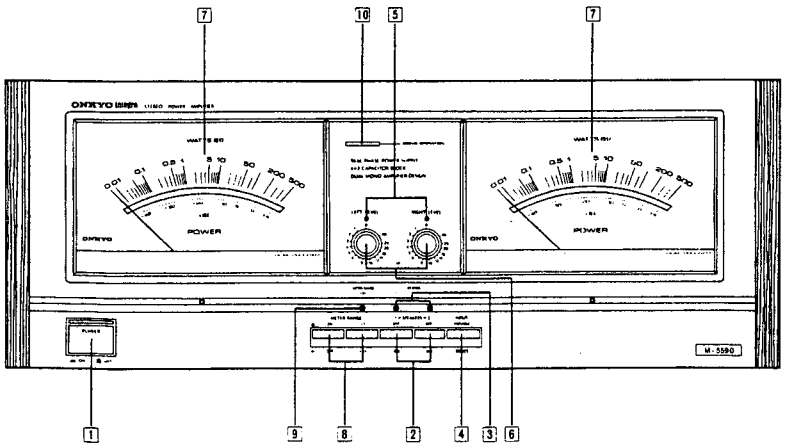
7. Check of direct current detection circuit of protection circuit

(1) With no load, when 1V DC is input, the speaker relay operates, the SERVO OPERATION LED goes out, and the meter lighting lamps change to red.
(2) Make the same check with −1V DC.

Caution: During this test, there should be absolutely no load connected and the load terminals must not be shorted.

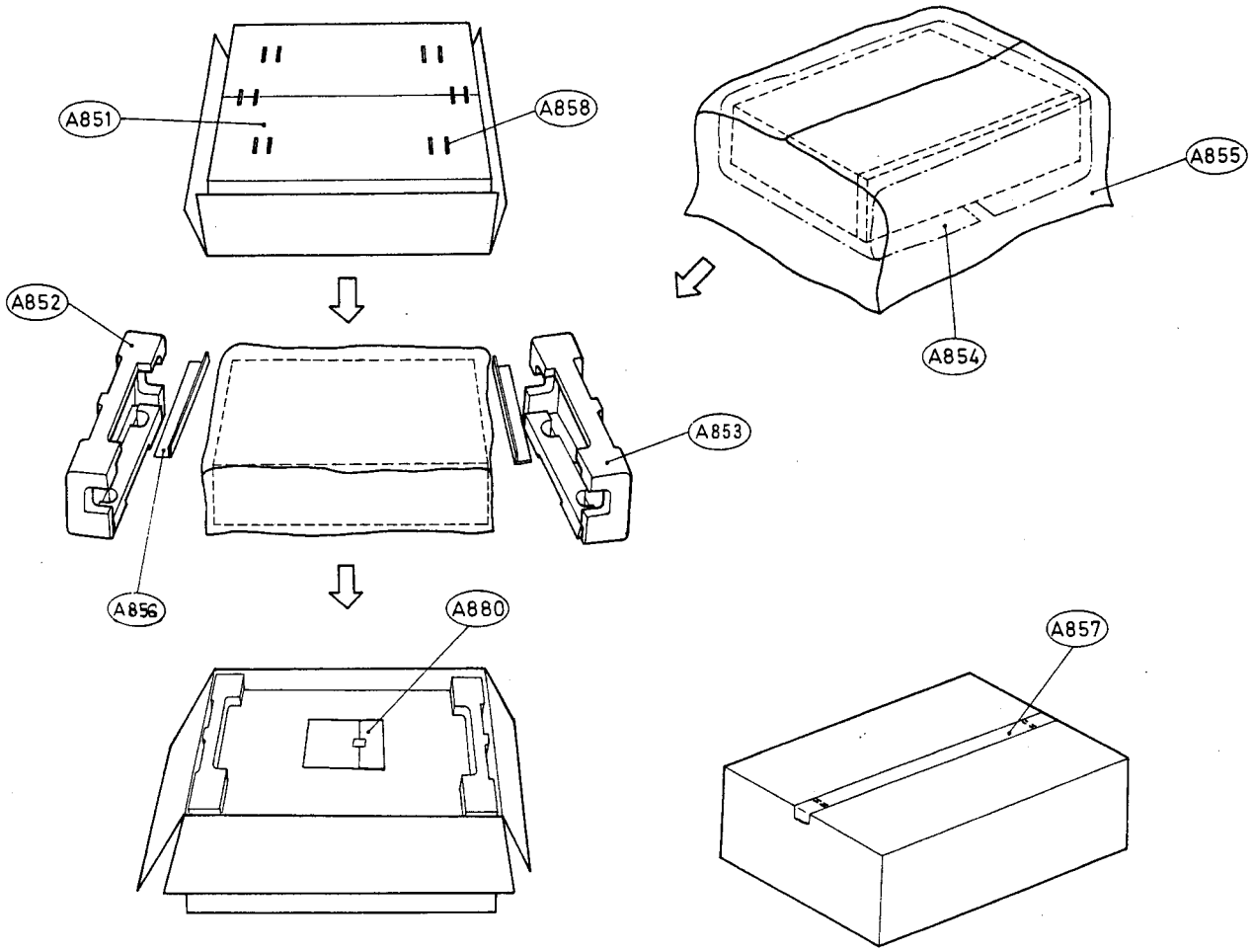
Note: When the protection circuit operates due to an abnormality in the circuit, after several seconds, the protection circuit holds. Also, even after the cause of the abnormality is eliminated, the circuit is held as is. To cancel, turn the power OFF for several minutes.

FRONT PANEL FACILITIES



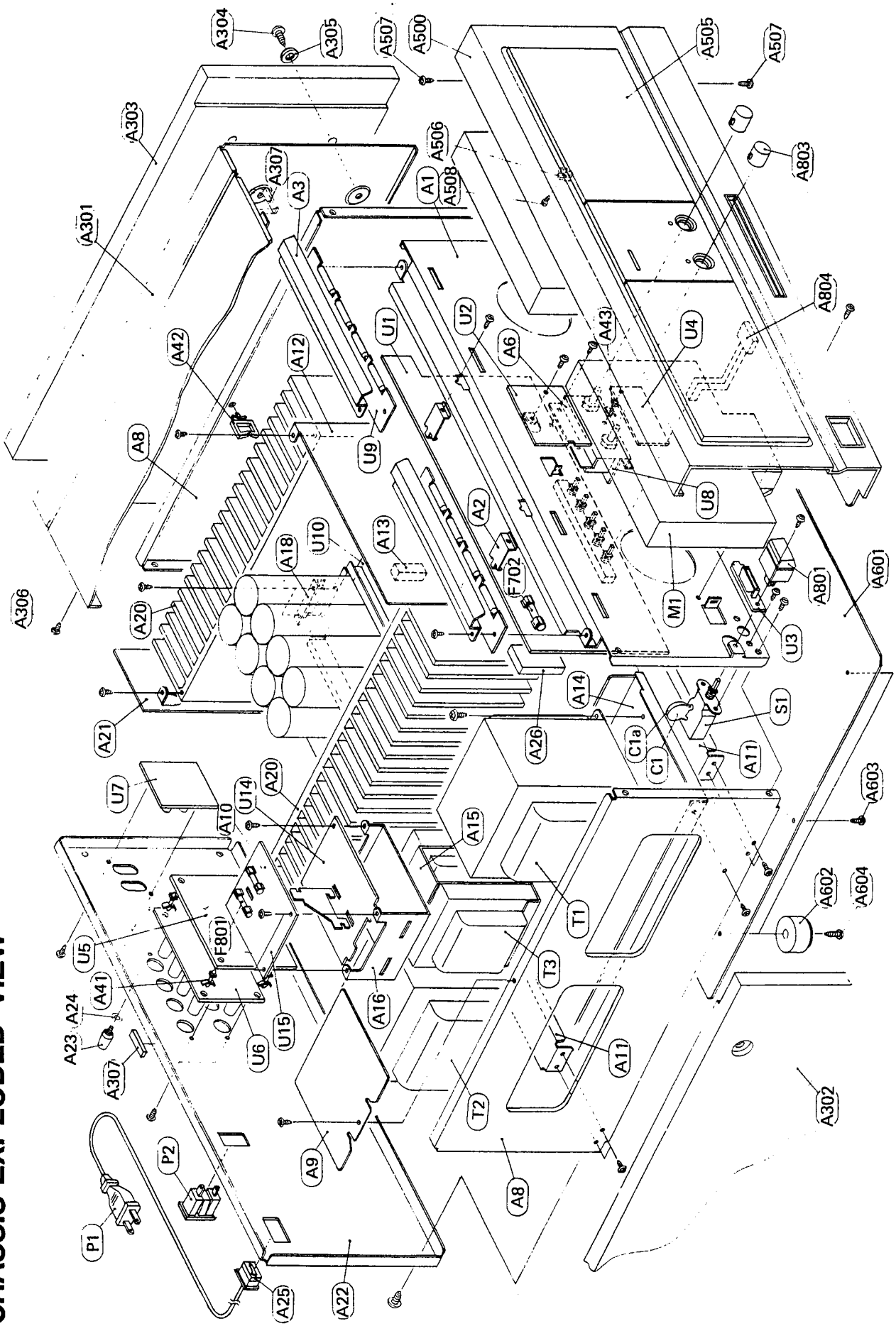
1. Power Switch (POWER)
2. Speaker Selector Switches (SPEAKERS)
3. Speaker Selector Indicators (SPEAKERS)
4. Input Selector Switch (INPUT)
5. Input Selector Indicators
6. Level Controls (LEFT/RIGHT LEVEL)
7. Peak Power Meters
8. Meter Range Selector Switches (METER RANGE)
9. Meter Range Indicator (METER RANGE)
10. Servo Operation Indicator (SERVO OPERATION)

PACKING PROCEDURES



REF NO.	PARTS NO.	DESCRIPTION
A851	29051308	Master carton box
A852	29091081	Pad ass'y, left
A853	29091084	Pad ass'y, right
A854	29095319	500 x 1000mm, Protection sheet
A855	29100038A	720 x 950mm, Poly-vinyl bag
A856	29095447	Sheet (P)
A857	260012	Damplon tape
A858	282301	Sealing hook
A880	Accessary bag ass'y	
	29341003	Instruction manual
	29365016B	Warranty card
	2010097	Connection cable
	29100006A	250 x 350mm, Poly-vinyl bag for accessary

CHASSIS-EXPLODED VIEW



CHASSIS-EXPLODED VIEW-PARTS LIST

REF NO.	PARTS NO.	DESCRIPTION
A1	27110285A	Front bracket
A2	27141064	Bracket (FPC)
A3	27141065A	Bracket (LAMP)
A6	27141066	Bracket (VOL)
A8	27115204A	Side bracket
A9	28175129	Insulating plate
A10	29360626-1	Label
A11	27130427	Bracket
A12	27150212B	Shield plate
A14	27130428A	Bracket (PT)
A15	27130429	Bracket (PHT)
A16	27141067	Bracket (PC)
A18	27141068	Bracket (HE)
A20	27160186	Radiator
A21	27150215A	Shield plate
A22	27120851	Back panel
	27120853	Back panel
A23	25060041	3 × 14mm, Ground terminal
A24	87644010	W4 × 10F(BC), Washer
A25	27300750	#2271, Bushing (Power supply cable)
A26	28140676	11 × 50 × 30mm, Cushion
A40	27190009	Holder
A41	27190480	Holder
A42	27300243	WS-2WS, Wire holder
A43	27190458	WLS-06-0, Holder
A301	28184319B	Top cover
A302	28185257	Side board (L)
A303	28185259	Side board (R)
A304	836440303	4STV × 30FN(BC), Screw
A305	870086	4 × 12BS(BC), Special washer
A306	838440089	4TTB + 8C(BC), Tapping screw
A307	28140020	4 × 10 × 40mm, Cushion
A500	17812121	Front panel ass'y
A505	28191351B	Clear plate
A506	27190451	Holder, (Grass)
A508	833430080	3TTP+8P(BC), Tapping screw
A601	27170226-1A	Bottom board
A602	280889B	Bottom leg
A603	831430088	3TTW +8B(BC), Tapping screw
A604	831430168	3TTW + 16B(BC), Tapping screw
A801	28322541	Knob ass'y (POW)
A803	28322542A	Knob (VOL)
A804	28322543A	Knob (PUSH)
Q449,Q450	2201653 or	2SC3856(O) or
Q453,Q454	2201655 or	2SC3856(P) or
Q457,Q458	2201654	2SC3856(Y), Transister
Q451,Q452	2201663 or	2SA1492(O) or
Q455,Q456	2201665 or	2SA1492(P) or
Q459,Q460	2201664	2SA1492(Y), Transister
⚠ T1	2300129	NPT-928G, Power transformer
⚠ T2	2300099	NPT-918G, Power transformer
⚠ T3,T4	231097	NCH-3144, Choke coil
⚠ S1	25035381	NPS-121-L345P, Power switch
⚠ P1	253092-1	AS-CEE-2, Power supply cable
M1,M2	243148	NIND-2000S148, Power meter
⚠ C1,C2	3500065A	0.01μF, AC400V, Capacitor (IS)
C1a,C2a	27300601	SB-1925, Cover (Capacitor)
F702	252044	2A ST-6, Secondary fuse
	252074	2A-SE-EAK, Secondary fuse
⚠ F803,F804	252077	4A-SE-EAK, Primary fuse
U1	17814515-1A	NAMA-2615-1A, Meter and protector circuit pc board ass'y
U2	17818516-1	NADIS-2616-1, Volume/Servo LED pc board ass'y
U3	17818517-1	NADIS-2617-1, Power LED pc board ass'y
U4	17818518-1	NADIS-2618-1, Speaker LED pc board ass'y
U5	17812519-1A	NAOP-2619-1A, Relay circuit pc board ass'y
U6	17812520-1B	NAST-2620-1B, Speaker terminal pc board ass'y
U7	17812521-1A	NAPJ-2621-1A, Input terminal pc board ass'y
U8	17818522-1	NAVR-2622-1, Level volume pc board ass'y
U9	17818523-1	NAPL-2623-1, Meter lamp pc board ass'y
U10	17812525-1A	NAPA-2625-1A, Power amplifier pc board ass'y
U11	17818526-1	NACC-2626-1, Transistor pc board ass'y
U12	17818527-1	NADA-2627-1, Transistor pc board ass'y
U13	17818528-1	NADA-2628-1, Transistor pc board ass'y
U14	17818529-1	NARC-2629-1, Power supply circuit pc board ass'y
U15	17814530-1A	NAFU-2630-1A, Fuse pc board ass'y

NOTE: THE COMPONENTS IDENTIFIED BY MARK ⚠ ARE CRITICAL FOR RISK OF FIRE AND ELECTRIC SHOCK. REPLACE ONLY WITH PARTS NUMBER SPECIFIED.

PRINTED CIRCUIT BOARD PARTS LIST

METER AND PROTECTOR CIRCUIT PC BOARD (NAMA-2615-1A)

CIRCUIT NO.	PARTS NO.	DESCRIPTION
	Transistors	
Q201,Q202	2212806 or	2SK389(BL) or
	2212807	2SK389(V)
Q601,Q602	2211945	2SK246(GR)
Q604,Q605	2211255	2SC1815(GR)
Q702	2211504	2SA950(Y)
Q703	2211455	2SA1015(GR)
Q704,Q705	2201276 or	2SB772(P) or
	2201275	2SB772(Q)
Q706	2201286 or	2SD882(P) or
	2201285	2SD882(Q)
	ICs	
Q203,Q204	222652	M5218L
Q603	222529	TA7318P(R)
Q606,Q607	222502	NJM4558DX
Q701	222584	TA7317P
	Diodes	
D201~D204	223155	1SS138
D205~D208	2239651 or	RD13E-B1 or
	2243241	MTZ13-A
D601,D602	223145	1S2076TD
D603,D604	2239672 or	RD15E-B2 or
	2243252	MTZ-15B
D605	223145	1S2076TD
D701	223155	1SS138
D702	2239493 or	RD6.2E-B3 or
D703	2239533 or	RD7.5E-B3 or
	2243183	MTZ7.5-C
	2243163	MTZ6.2-C
D705	223868	2W02
	Capacitors	
C201~C204	372125614	560pF, 50V, Styrene
C205~C208	372122214	220pF, 50V, Styrene
C215~C218	391251017	100 μF, 25V, Elect. (MUSE)
C223~C226	354741019	100 μF, 16V, Elect.
C601,C602	354784799	0.47μ, 50V, Elect.
C605,C606	354780339	3.3 μF, 50V, Elect.
C607	354780109	1 μF, 50V, Elect.
C608,C609	379121035	0.01μF, 50V, Film (DEW)
C613,C614	354752209	22μF, 25V, Elect.
C615,C616	354780339	3.3 μF, 50V, Elect.
C617,C618	354754709	47μF, 25V, Elect.
C701,C702	354722219	220 μF, 6.3V, Elect.
C704	354732209	22μF, 10V, Elect.
C706	354784799	0.47μF, 50V, Elect.
C707	354732219	220 μF, 10V, Elect.
C708	354742229	2200μF, 16V, Elect.
C710	379121045	0.1 μF, 50V, Film (DEW)
C711	354741009	10μF, 16V, Elect.
	Resistors	
R215,R216	441722434	24 kΩ, 2W, Metal oxide film
R225,R226	442524724	4.7kΩ, 1/2W, Metal oxide film
R613,R614	5221023	N10HR470BEM, Semi-fixed
R633,R634	4000028	D33A, Thermistor
R645,R646	5221023	N10HR470BEM, Semi-fixed
R717	442520684	6.8 Ω, 1/2W, Metal oxide film
R718	442528204	82Ω, 1/2W, Metal oxide film
R719	442524714	470 Ω, 1/2W, Metal oxide film
R720	441720274	2.7 Ω, 2W, Metal oxide film
R721	442524714	470 Ω, 1/2W, Metal oxide film
R722	442522214	220 Ω, 1/2W, Metal oxide film
R723	442520474	4.7 Ω, 1/2W, Metal oxide film
R724	441721814	180 Ω, 2W, Metal oxide film
R725	441720474	4.7 Ω, 2W, Metal oxide film
R727	442520474	4.7 Ω, 1/2W, Metal oxide film
R735	442521824	1.8kΩ, 1/2W, Metal oxide film
	Switch	
S701~S705	25035522	NPS-242-222-162L484
	Relay	
RL601	25065048	FRL-644D-12/2AS
	Fuse holders	
F701a	250113	S-N5051
F702a	25050065	YSH403T
	Fuse label	
	29360364	T2A/250V
	Sockets	
JC601,JC607	25050282	NSCT-5P110
JC409	25050283	NSCT-6P111
JC603	25050281	NSCT-4P109
JC401,JC402,JC604	25050285	NSCT-8P113
P201,P202	2000553	NSAS-6P509 Socket ass'y
P703	2000550	NSAS-6P506 Socket ass'y

VOLUME/SERVO LED PC BOARD (NADIS-2616-1)

CIRCUIT NO.	PARTS NO.	DESCRIPTION
	Diodes	
D710,D711	225137CG or	SEL-2413E-CG or
	225137CY or	SEL-2413E-CY or
	225137DG or	SEL-2413E-DG or
	225137DY	SEL-2413E-DY
D712,D713	225174 or	SLR55MC3N or
	225173	SLR55MC3M
	Holders	
	27190453	Holder (SLED)
	27190319A	Holder (LED)

POWER LED PC BOARD (NADIS-2617-1)

CIRCUIT NO.	PARTS NO.	DESCRIPTION
	Diodes	
D714,D715	225142	SEL2913K
	Holder	
	27190454	Holder (PLED)

SPEAKER LED PC BOARD (NADIS-2618-1)

CIRCUIT NO.	PARTS NO.	DESCRIPTION
	Diodes	
D716	225167RB or	GL-5HY10-RB or
	225167RC	GL-5HY10-RC
D717,D718	225174 or	SLR55MC3N or
	225173	SLR55MC3M

CIRCUIT NO.	PARTS NO.	DESCRIPTION
	Holders	
	27190319A	Holder (LED)

RELAY CIRCUIT PC BOARD (NAOP-2619-1A)

CIRCUIT NO.	PARTS NO.	DESCRIPTION
	Diodes	
D781~D783	223145	1S2076TD
	Coils	
L781~L784	231015	S-0.8C
L785,L786	230904	B-20L-44
	Capacitors	
C781,C782	379131025	0.001μF,100V,Film (DEW)
C783~C786	379121245	0.12μF, 50V, Film (DEW)
	Resistors	
R781~R784	441620514	5.1 Ω, 1W, Metal oxide film
R785,R786	441720514	5.1 Ω, 2W, Metal oxide film
	Relaies	
RL781 ~RL783	25065036	NRL-4P3A-DC12-01
	Sockets	
JC407,JC408	25050273	NSCT-9P101
JC603	25050268	NSCT-4P96

SPEAKER TERMINAL PC BOARD (NAST-2620-1B)

CIRCUIT NO.	PARTS NO.	DESCRIPTION
	Capacitors	
C791~C794	379131025	0.001μF,100V,Film(DEW)
	Terminals	
P791,P792	25060101	NTM-4PDMN41

INPUT TERMINAL PC BOARD (NAPJ-2621-1A)

CIRCUIT NO.	PARTS NO.	DESCRIPTION
	Capacitors	
C101~C104	372123914	390pF, 50V, Styrene
	Terminal	
P101	25045196	NPJ-4PDBL77

LEVEL VOLUME PC BOARD (NAVR-2622-1)

CIRCUIT NO.	PARTS NO.	DESCRIPTION
	Resistors	
R151,R152	5104183A	N27DGL30KB30
	Sockets	
P151	2000551	NSAS-6P507
P152	2000552	NSAS-6P508

METER LAMP PC BOARD (NAPL-2623-1)

CIRCUIT NO.	PARTS NO.	DESCRIPTION
	Lamps	
PL881 ~PL884	210191	PL14V150mA (Green)
PL885 ~PL888	210192	PL14V150mA (Orange)

POWER AMPLIFIER PC BOARD (NAPA-2625-1A)

CIRCUIT NO.	PARTS NO.	DESCRIPTION
	Transistors	
Q401~Q404	2211732 or	2SC1845(F) or
	2211733	2SC1845(E)
Q405,Q406	2211792 or	2SA992(F) or
	2211793	2SA992(E)
Q407,Q408	2211414	2SC1627(Y)
Q411~Q414	2211782 or	2SA991(F) or
	2211783	2SA991(E)
Q415~Q418	2211902 or	2SC1844(F) or
	2211903	2SC1844(E)
Q421~Q424	2211359 or	2SA949-Y(ONK) or
	2211358	2SA949-O(ONK)
Q425,Q426	2211639 or	2SC2229-Y(ONK) or
	2211638	2SC2229-O(ONK)
Q427,Q428	2211792 or	2SA992(F) or
	2211793	2SA992(E)
Q429,Q430	2212560	2SC3333
Q431,Q432	2211255	2SC1815(GR)
Q433,Q434	2211455	2SA1015(GR)
Q435,Q436	2211639 or	2SC2229-Y(ONK) or
	2211638	2SC2229-O(ONK)
Q437,Q438	2211359 or	2SA949-Y(ONK) or
	2211358	2SA949-O(ONK)
Q441	2200394	2SC1625(Y)
Q442	2200404	2SA815(Y)
	Diodes	
D401~D408	223155	1SS138
D409~D412	225218	LTZ-MR15, LED
D413~D416	223162	1SS82
D417~D420	225218	LTZ-MR15, LED
D421,D422	223155	1SS138
D423,D424	223168	DA210S
D431,D432	223155	1SS138
D433,D434	223145	1S2076TD
D435~D438	223863	GP-30DL
D439~D442	223162	1SS82
D451,D452	2243293	MTZ22-C
D453	2243251	MTZ15-A
D454,D455	223155	1SS138
	Coils	
L401,L402	231098	NCH-4145
	Capacitors	
C198,L199	379124725	4700pF, 50V, Film (DEW)
C405~C408	354723319	330 μF, 6.3V, Elect.
C413~C416	391241007	10μF, 16V, Elect. (MUSE)
C417,C418	379121025	0.001 μF, 50V, Film (DEW)
C423,C424	391241007	10μF, 16V, Elect. (MUSE)
C425~C428	379131035	0.01μF, 100V, Film (DEW)
C435,C436	379131045	0.1 μF, 100V, Film (DEW)
C437,C438	379122245	0.22μF, 50V, Film (DEW)
C443~C446	379124735	0.047 μF, 50V, Film (DEW)
C451,C452	354752209	22μF, 25V, Elect.
C453,C454	354751019	100 μF, 25V, Elect.
C455~C462	~~354~~	~~10000 μF, 00V, Elect.~~ 3503248
C463~C466	354780339	3.3 μF, 50V, Elect.

CIRCUIT NO.	PARTS NO.	DESCRIPTION
	Resistors	
R401~R404	442525614	560 Ω, 1/2W, Metal oxide film
R405,R406	442523314	330 Ω, 1/2W, Metal oxide film
R411,R412	442521614	160 Ω, 1/2W, Metal oxide film
R413,R414	441625634	56 kΩ, 1W, Metal oxide film
R415,R416	442521534	15 kΩ, 1/2W, Metal oxide film
R423,R424	5225076	N10HR22KBDM, Semi-fixed
R425~R428	442520514	5.1 Ω, 1/2W, Metal oxide film
R429~R432	441724324	4.3kΩ, 2W, Metal oxide film
R433~R436	442521214	120 Ω, 1/2W, Metal oxide film
R445~R448	442523914	390 Ω, 1/2W, Metal oxide film
R449,R450	442521204	12Ω, 1/2W, Metal oxide film
R457~R460	442525104	51Ω, 1/2W, Metal oxide film
R463,R464	442520514	5.1 Ω, 1/2W, Metal oxide film
R465,R466	441720754	7.5 Ω, 2W, Metal oxide film
R467~R478	442520224	2.2 Ω, 1/2W, Metal oxide film
R479~R490	442521014	100 Ω, 1/2W, Metal oxide film
R491~R504	4000080	0.47Ω, 5W, Metal plate
R505~R516	4000063	0.47Ω, 2W, Metal plate
R531,R532	441621024	1kΩ, 1W, Metal oxide film
R535	441724324	4.3kΩ, 2W, Metal oxide film
	Sockets	
JC403,JC404	25050267	NSCT-3P95
JC405,JC406,JC409	25050270	NSCT-6P98
	Bracket	
	27130430	Bracket (KE)
	Bus plate	
	27300826A	Bus (S)
	27300827A	Bus (C)

TRANSISTOR PC BOARD (NACC-2626-1)

CIRCUIT NO.	PARTS NO.	DESCRIPTION
	Transistor	
Q403(Q444)	2212864 or	2SC3419(Y) or
	2212863	2SC3419(O)
	Capacitor	
C463(C464)	379122235	0.022 μF, 50V, Film (DEW)

TRANSISTOR PC BOARD (NADA-2627-1)

CIRCUIT NO.	PARTS NO.	DESCRIPTION
	Transistor	
Q445(Q446)	2201684 or	2SC3298A(Y) or
	2201683	2SC3298A(O)

TRANSISTOR PC BOARD (NADA-2628-1)

CIRCUIT NO.	PARTS NO.	DESCRIPTION
	Transistor	
Q447(Q448)	2201674 or	2SA1306A(Y) or
	2201673	2SA1306A(O)

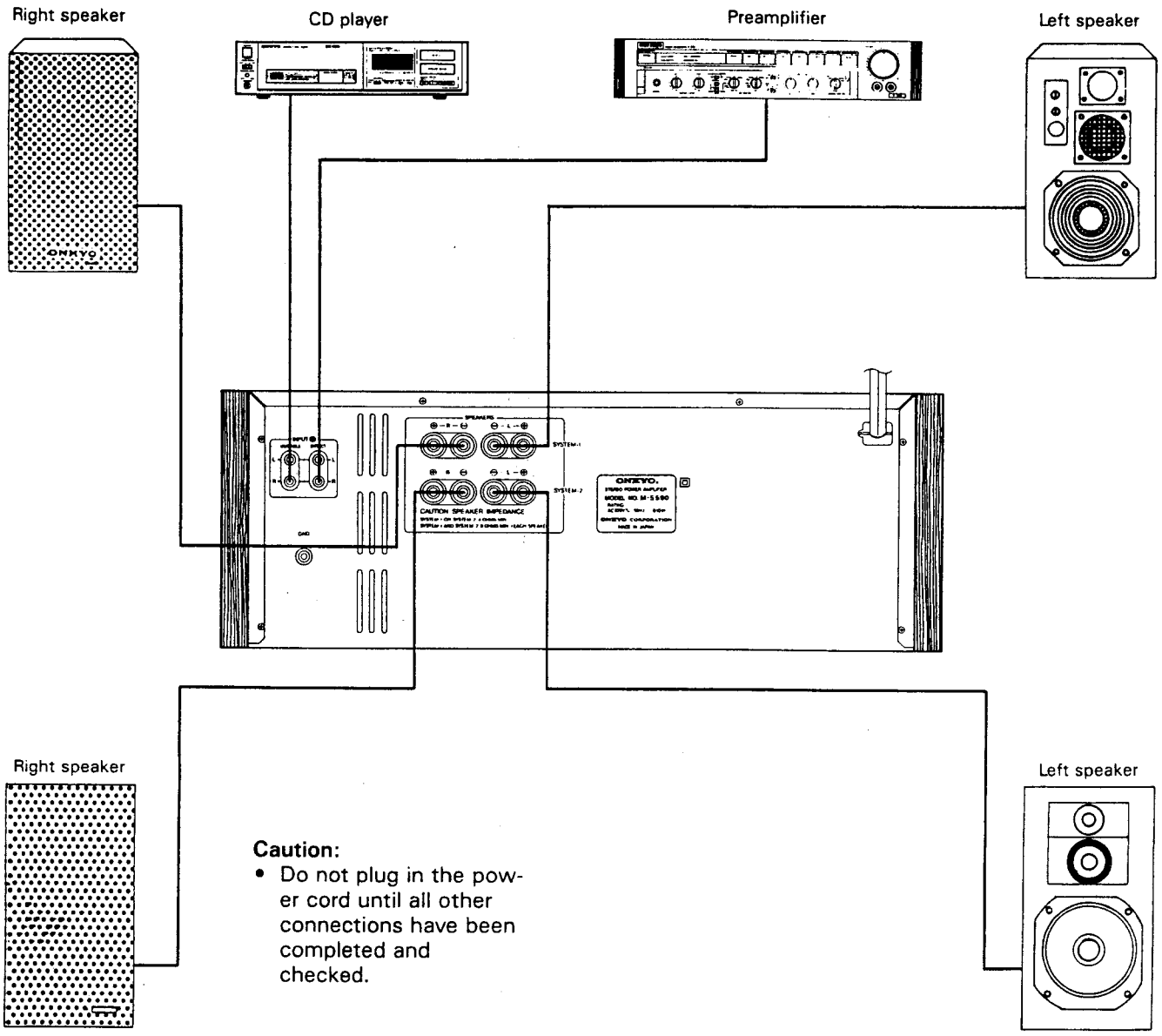
POWER SUPPLY CIRCUIT PC BOARD (NARC-2629-1)

CIRCUIT NO.	PARTS NO.	DESCRIPTION
	Diodes	
D801,D802	22380008	RB604
	Capacitors	
C801~C804	375103345	0.33μF, 125V, Film (ME)
C805,C806	375104745	0.47μF, 125V, Film (ME)
	Resistors	
R801~R804	442522294	0.22Ω, 1/2W, Metal oxide film
R805,R806	442527504	75Ω, 1/2W, Metal oxide film

FUSE PC BOARD (NAFU-2630-1A)

CIRCUIT NO.	PARTS NO.	DESCRIPTION
	Fuse holders	
F803a,F804a	25050065	YSH403T
	Terminals	
P801,P802	25060092	NTM-1S33

SYSTEM CONNECTIONS

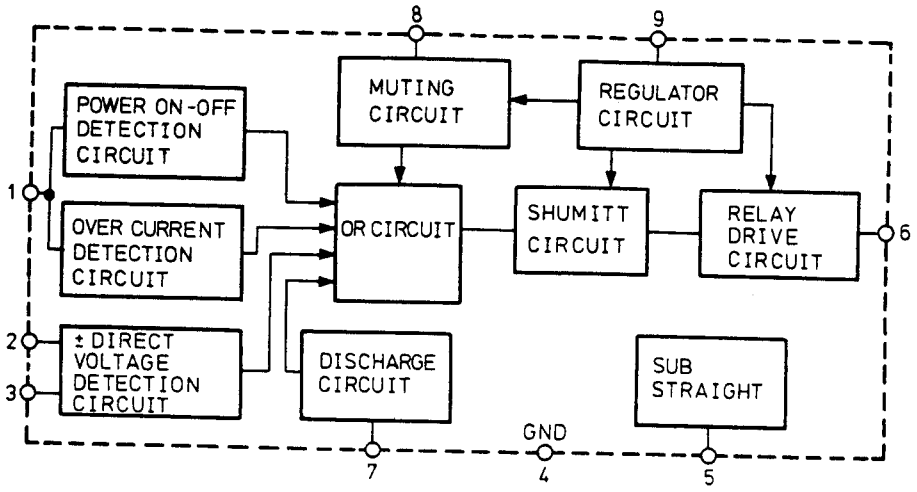


Caution:

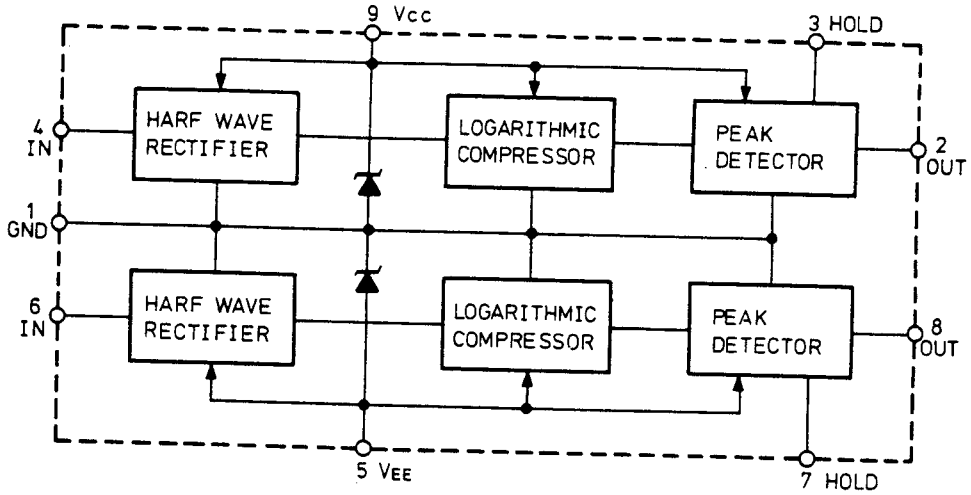
- Do not plug in the power cord until all other connections have been completed and checked.

IC BLOCK DIAGRAM

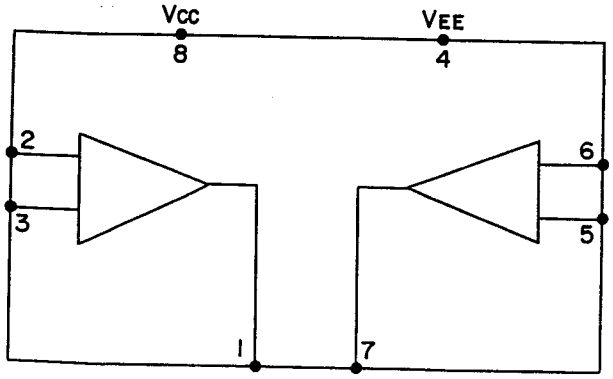
TA7317p(Protective Driver)



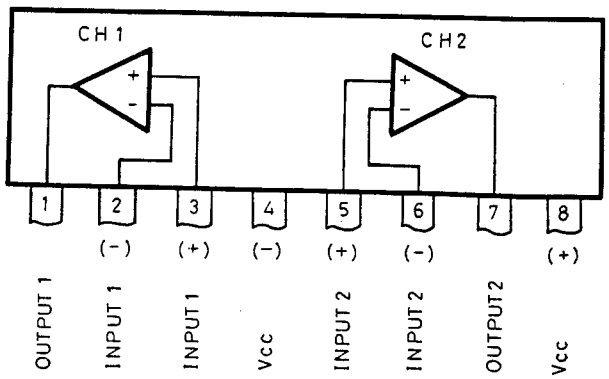
TA7318p(Meter Dirver)



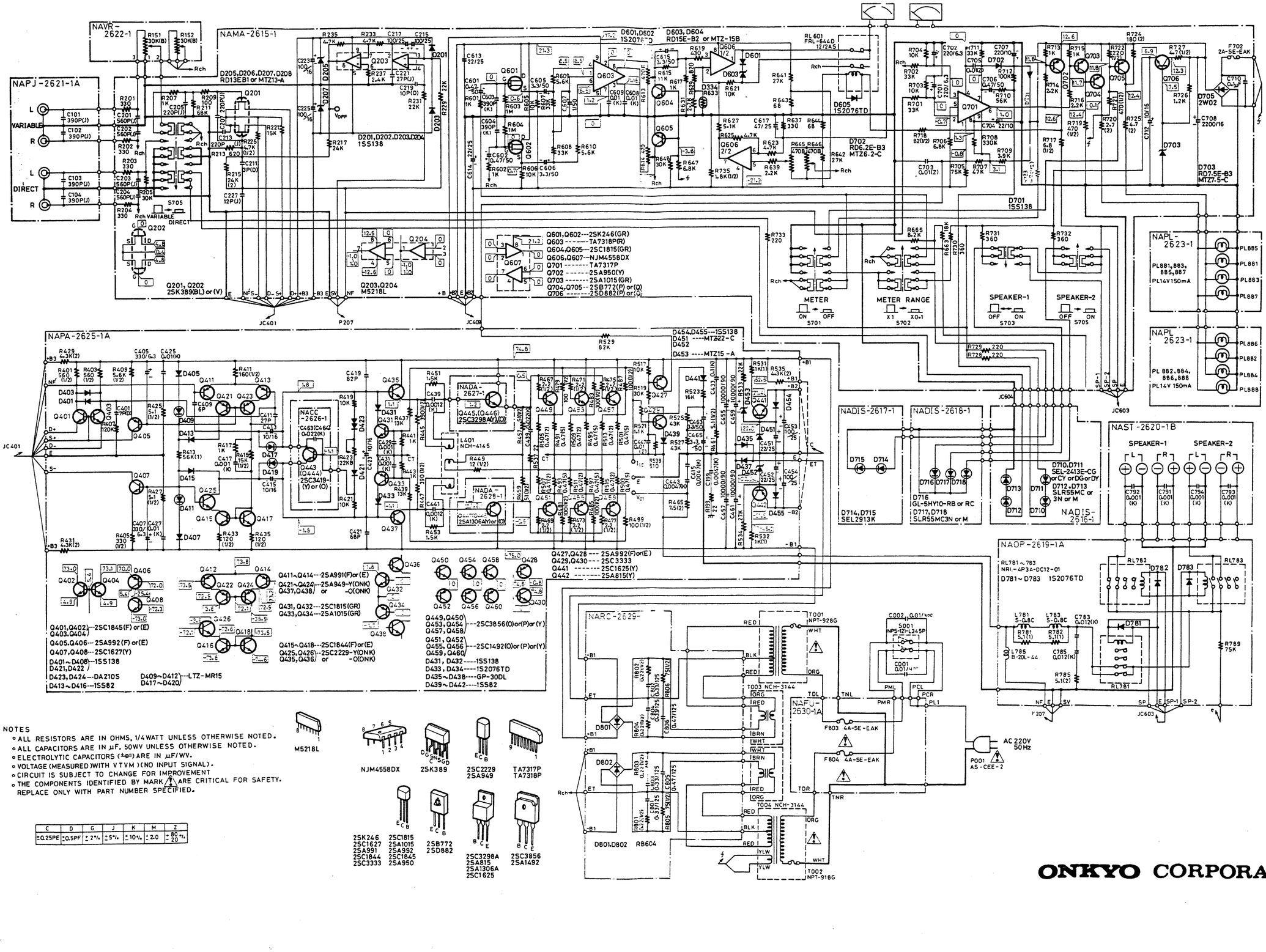
NJM4558(OP Amp.)



M5218L(OP Amp.)



SCHEMATIC DIAGRAM



NOTES
- ALL RESISTORS ARE IN OHMS, 1/4WATT UNLESS OTHERWISE NOTED.
- ALL CAPACITORS ARE IN μF, 50WV UNLESS OTHERWISE NOTED.
- ELECTROLYTIC CAPACITORS (+B=) ARE IN μF/WV.
- VOLTAGE (MEASURED)WITH VTVM)(NO INPUT SIGNAL).
- CIRCUIT IS SUBJECT TO CHANGE FOR IMPROVEMENT
- THE COMPONENTS IDENTIFIED BY MARK ⚠ ARE CRITICAL FOR SAFETY. REPLACE ONLY WITH PART NUMBER SPECIFIED.

C	D	G	J	K	M	Z
±0.25PF	±0.5PF	± 2%	± 5%	± 10%	± 20	+ 80 % − 20 %

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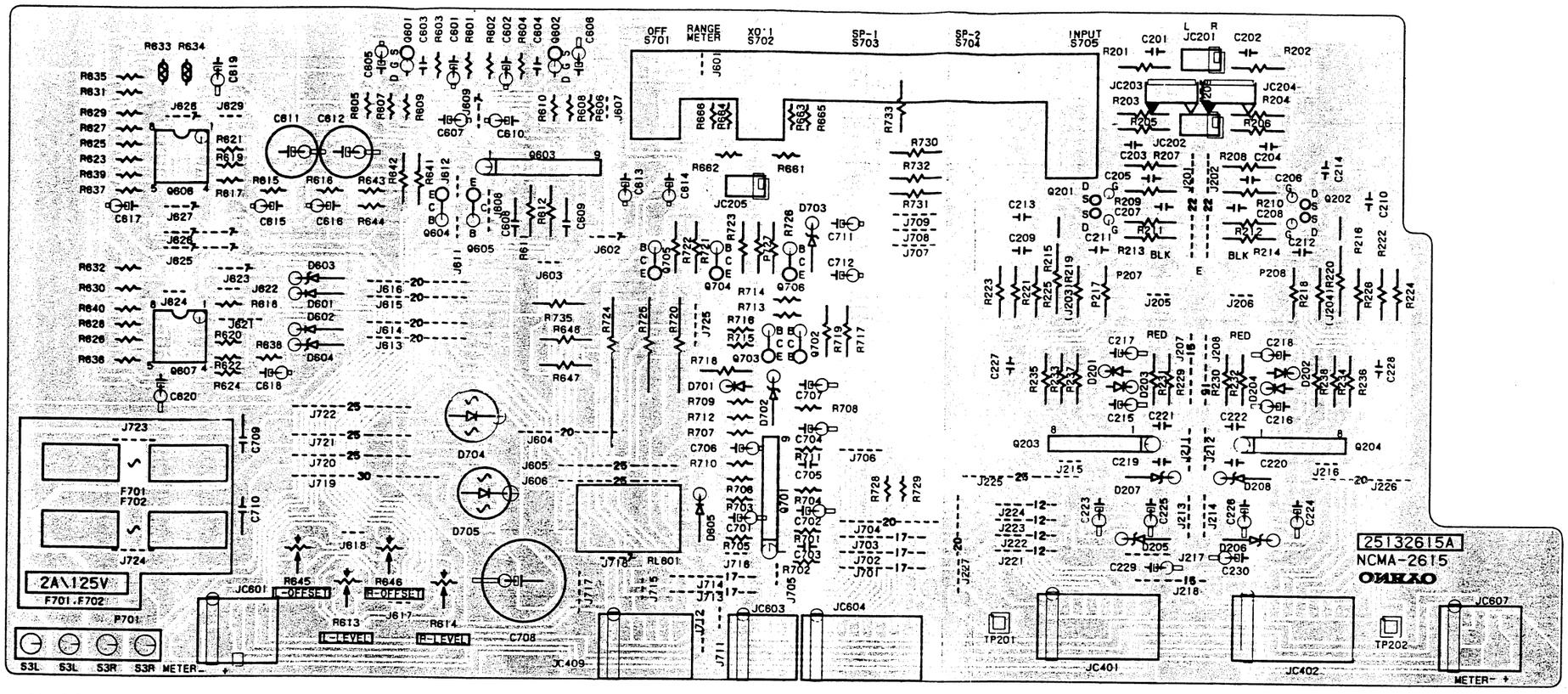
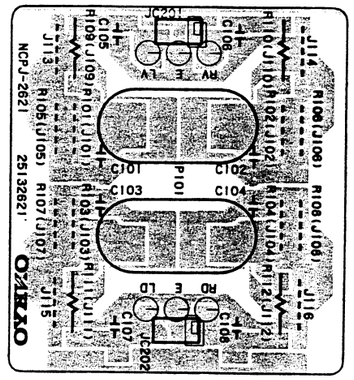
PRINTED CIRCUIT BOARD VIEW FROM BOTTOM SIDE

NAMA-2615

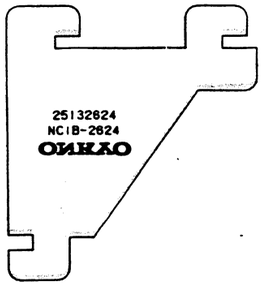


NAPJ-2621



NACC-2626

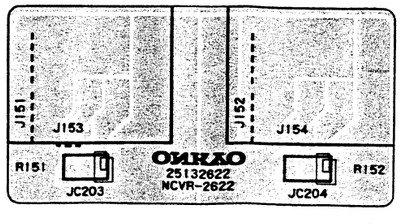
NCIB-2624



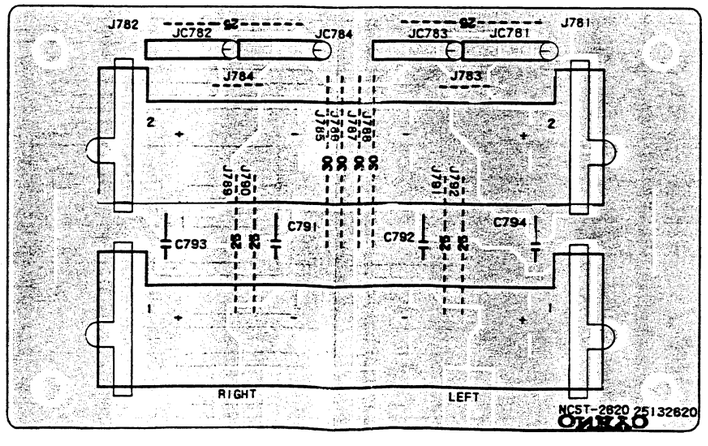
NADA-2627

NADA-2628

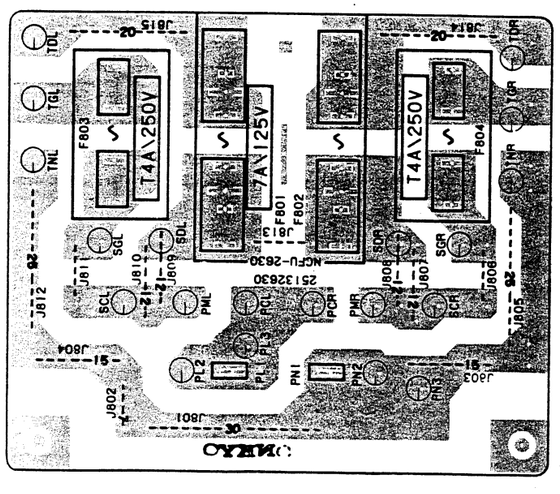
NAVR-2622



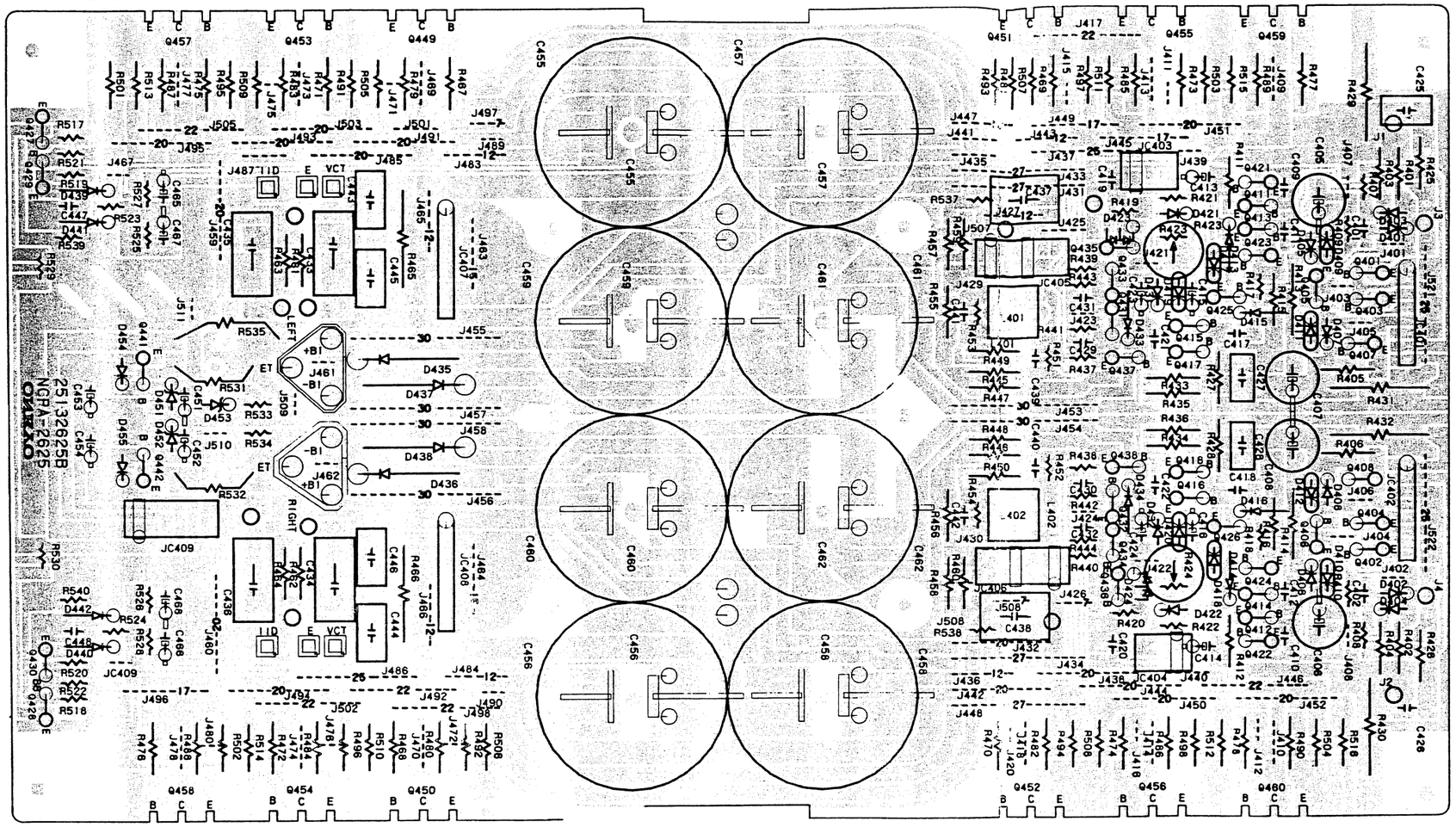
NAST-2620



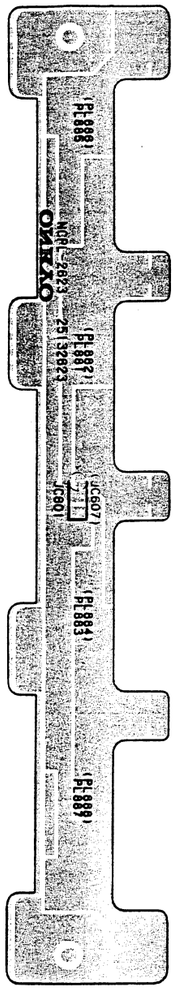
NAFU-2630



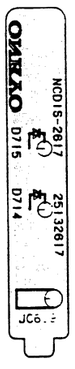
NAPA-2625



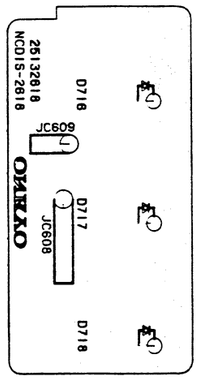
NAPL-2623



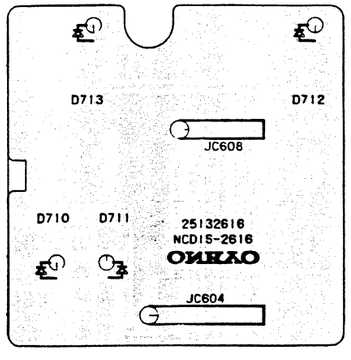
NADIS-2617



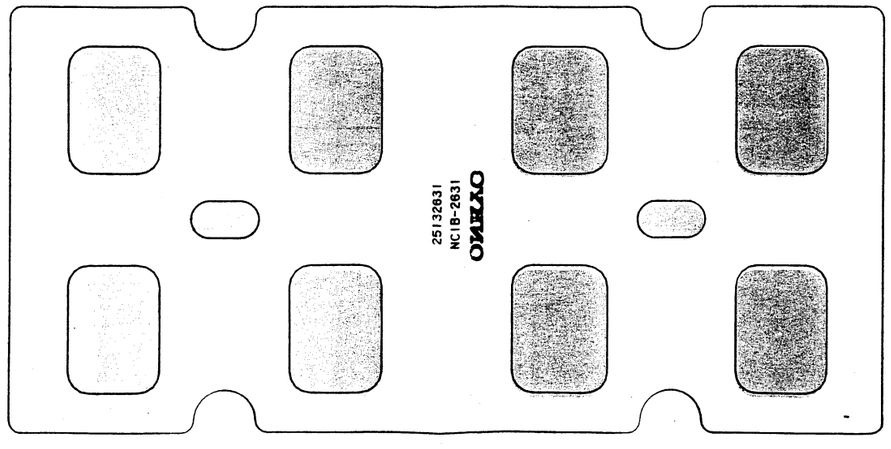
NADIS-2618



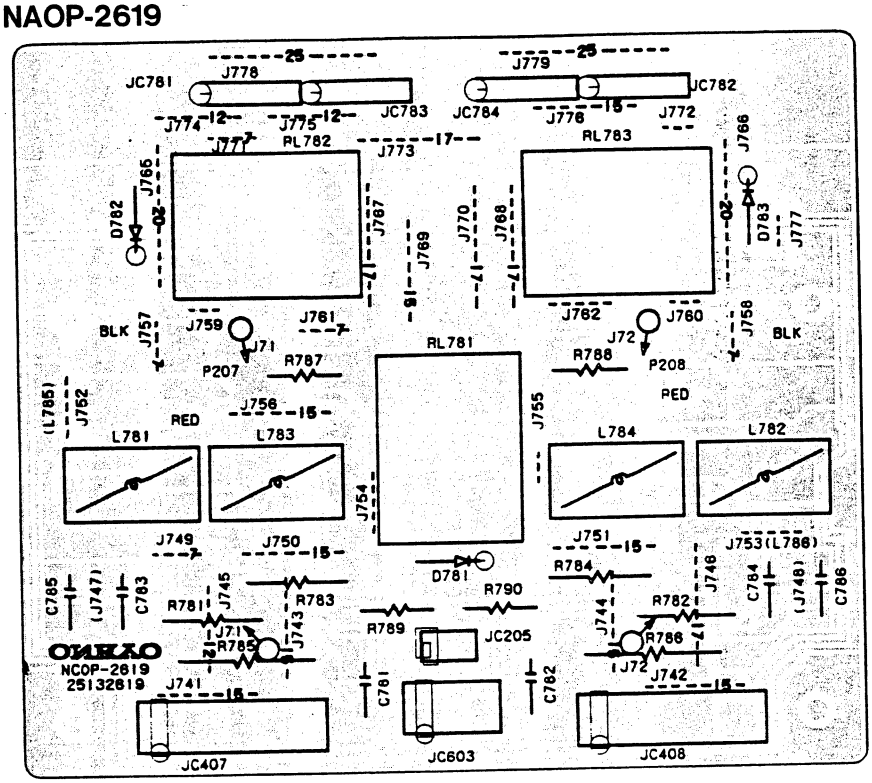
NADIS-2616



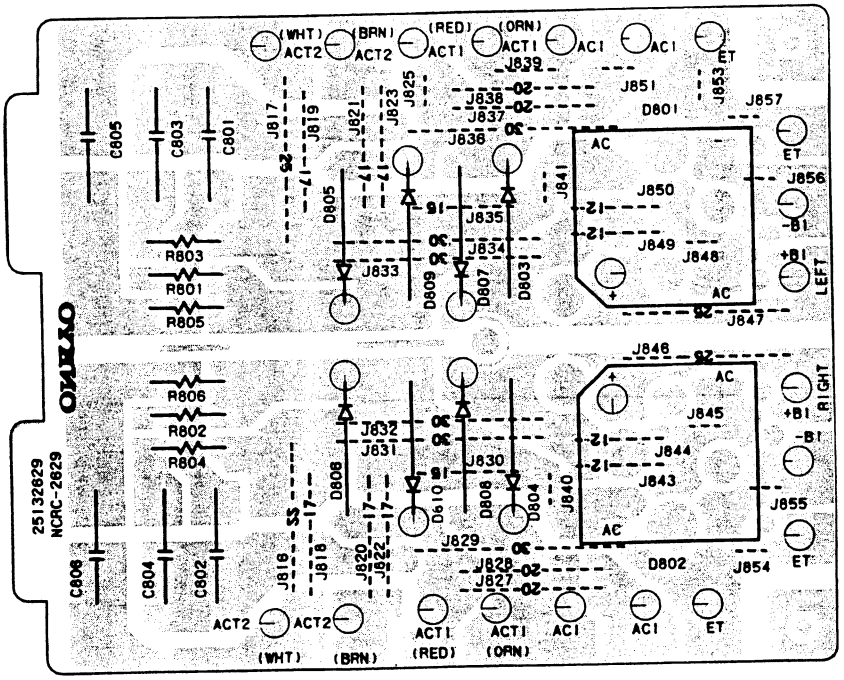
NCIB-2631



NAOP-2619



NARC-2629



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